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A continuation of a previous study -- "Relationships Between Teacher Characteristics and Student Behavior: Part I" -- is presented. A further analysis of the teacher matrix revealed that those teachers viewed to be near the warm, permissive end of the scale were not found to be less well liked by the children. They made less achievement gain in reading comprehension but the excessive affiliation on the part of the first grade teacher is that which is disliked. In order to assess the interaction of teacher-pupil characteristics as affecting pupil performance, teachers were placed into three groups: controlling, turbulent, and fearful, and the students into three groups: strivers-conformers, waverers, and opposers. Different sets of relationships between teacher-type and student-type were explored. Some of the findings were as follows: the three pupil-types differed significantly with respect to their performances on the creativity measures; the conformers-strivers repeatedly showed highest performance and the opposers consistently showed the poorest performance of the three groups. Generally speaking, the fearful teacher appears to have the most positive effect on pupil achievement gains, and the turbulent teacher the most negative effects.

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RELATIONSHIPS BETWEEN TEACHER CHARACTERISTICS AND STUDENT BEHAVIOR - PART II

COOPERATIVE RESEARCH PROJECT NO. 2096

NORMAN E. WALLEN

UNIVERSITY OF UTAH

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RELATIONSHIPS BETWEEN TEACHER CHARACTERISTICS AND STUDENT BEHAVIOR--PART II

Cooperative Research Project No. 2096

by

Norman E. Wallen

University of Utah

Department of Educational Psychology

1964

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TABLE OF CONTENTS

ACKNOWLEDGEMENTS		iii
LIST OF TABLES		vi
CHAPTER		PAGE
I.	BACKGROUND	1.01
	Measures of Teacher and Pupil Characteristics	1.01
	Teacher Measures	1.02
	Pupil Measures	1.07
	Summary of the Major Findings of Part I	1.12
	Analyses Conducted in the Present Study	1.17
II.	FURTHER ANALYSIS OF THE TEACHER MATRIX EMPLOYING ADDITIONAL MEASURES	2.01
	Results	2.03
III.	THE INTERACTION OF TEACHER-PUPIL CHARACTERISTICS AS AFFECTING PUPIL PERFORMANCE	3.01
	Dependent Variables	3.02
	Selection of Pupil Types	3.03
	Selection of Teacher Types	3.06
	Results	3.15
	General Design of Analyses	3.15
	The Effects of Pupil-Types on Pupil Creativity as Measured by the Torrance Tests	3.17
	Three Effects of Pupil-Teacher Interactions on Creativity as Measured by the Torrance Tests	3.19
	The Effects of Pupil-Types, Teacher-Types, and Pupil-Teacher Interactions on Pupil Achievement Gains as Measured by the California Achievement Tests	3.22
IV.	INTERCORRELATIONS AMONG PUPIL MEASURES	4.01
	Results	4.01
	Gain Scores As Related To Other Variables	4.02
	Relationship of Test Anxiety To Other Measures	4.03
	Creativity Tests	4.05
	Questionnaire Measures	4.06
	Russell Sage Test	4.08
	Sex Differences on CMM and CAT	4.08

CHAPTER		PAGE
	Other	4.09
V.	CLASS GAINS ON TESTS OF CREATIVITY RELATED TO GAINS IN ACHIEVEMENT	5.01
REFERENCES		R.01

LIST OF TABLES

TABLE		PAGE
2.01	CORRELATIONS BETWEEN ADDITIONAL MEASURES OF TEACHER CHARACTERISTICS (RE-CATEGORIZED VERBAL STATEMENTS, DRAWINGS, AND Q-SORTS) AND THE ORIGINAL MEASURES (FACTOR I AND RATINGS--CONTROL AND AFFILIATION)	2.07
2.02	CORRELATIONS BETWEEN ADDITIONAL MEASURES OF TEACHER CHARACTERISTICS (RE-CATEGORIZED VERBAL STATEMENTS, DRAWINGS, AND Q-SORTS) AND CERTAIN PUPIL MEASURES (ANXIETY, LIKING FOR SCHOOL, ACHIEVEMENT GAINS)	2.08
3.01	MEAN SCORES ON THE FOUR PERSONALITY MEASURES SERVING AS CRITERIA FOR SELECTION OF THREE PUPIL TYPES ACROSS THREE TEACHER TYPES AND FOR COMBINED TEACHER TYPES FOR GRADE ONE	3.07
3.02	MEAN SCORES ON THE FOUR PERSONALITY MEASURES SERVING AS CRITERIA FOR SELECTION OF THREE PUPIL TYPES ACROSS THREE TEACHER TYPES AND FOR COMBINED TEACHER TYPES FOR GRADE TWO	3.08
3.03	MEAN SCORES ON THE FOUR PERSONALITY MEASURES SERVING AS CRITERIA FOR SELECTION OF THREE PUPIL TYPES ACROSS THREE TEACHER TYPES AND FOR COMBINED TEACHER TYPES FOR GRADE THREE	3.09
3.04	MEAN SCORES ON THE FOUR PERSONALITY MEASURES SERVING AS CRITERIA FOR SELECTION OF THREE PUPIL TYPES ACROSS THREE TEACHER TYPES AND FOR COMBINED TEACHER TYPES FOR GRADE FOUR	3.10
3.05	MEAN SCORES ON THE FOUR PERSONALITY MEASURES SERVING AS CRITERIA FOR SELECTION OF THREE PUPIL TYPES ACROSS THREE TEACHER TYPES AND FOR COMBINED TEACHER TYPES FOR GRADE FIVE	3.11
3.06	MEAN CRITERION PERSONALITY MEASURE SCORES FOR THREE TEACHER-TYPES FOR EACH GRADE AND FOR ALL GRADES COMBINED	3.16
3.07	F-RATIOS FOR PUPILS (S), TEACHERS (T), AND PUPIL BY TEACHER INTERACTIONS (S x T) ON ELEVEN CREATIVITY AND THREE ACHIEVEMENT-GAIN MEASURES FOR GRADE ONE THROUGH FIVE	3.18
3.08	MEANS OF THE FOUR SIGNIFICANT CREATIVITY ANALYSES FOR THE THREE PUPIL TYPES	3.20

TABLE

		PAGE
3.09	MEANS OF PUPIL CREATIVITY MEASURES FOR TEACHER TYPES	3.21
3.10	MEANS OF THE THREE SIGNIFICANT PUPIL-TEACHER INTERACTIONS ON PUPIL CREATIVITY MEASURES	3.23
3.11	MEANS OF ACHIEVEMENT GAINS SCORES FOR TEACHER TYPES FOR GRADES ONE THROUGH FIVE	3.24
3.12	MEANS OF THE SIGNIFICANT PUPIL-TEACHER INTERACTION ON THE READING COMPREHENSION MEASURE	3.26
5.01	"CREATIVITY" GAINS AND ACHIEVEMENT GRADES BY TEACHER (N = 18)	5.02

CHAPTER I

BACKGROUND

This report is a continuation of a previous study--"Relationships Between Teacher Characteristics and Student Behavior: Part I"--published as a final report for the U. S. Department of Health, Education, and Welfare in November, 1963. At the conclusion of the prior report it was felt that the data were sufficiently promising to warrant further analyses; it is these additional analyses which are reported in this volume. The remainder of this chapter is devoted to a summary of the data available, the principle results of the previous data analyses, and a brief introduction to the analyses reported in subsequent chapters.

Measures of Teacher and Pupil Characteristics

The measures to follow were obtained at various times during a four year period during the years 1959 through 1963. They pertain to a sample of 65 elementary school teachers which is in turn a sub-sample (selective only in terms of permanence in the school system) from a larger sample of 120 teachers utilized in a previously reported study which demonstrated that the extent of controlling behavior within the classroom was predictable from a paper-and-pencil questionnaire (Wallen and others, 1963; Travers and others, 1961).

Teacher Measures

Six elementary schools are represented in this sample and the distribution across grades yields approximately twelve teachers in each of grades one through five. The measures available for these teachers are as follows:

1. Obtained during the academic years 1959-1960 and 1960-1961.
   a. Scores intended to reflect four needs as follows: control, affiliation, achievement, and recognition. Four paper-and pencil tests were used:
      (1) A questionnaire regarding preferences for various activities related to teaching and to children (TPS).
      (2) A projective test requiring explanations of examples of behavior (USB).
      (3) A questionnaire regarding attitudes about educational objectives (Obj.).
      (4) A test requiring selection of preferred teacher responses to hypothetical classroom situations (Sit.)

Thus a total of sixteen scores were obtained--four needs across four tests.

   b. Scores intended to reflect teacher behavior in the classroom. Our primary interest was in the following postulated dimensions of teacher behavior:
      (1) Achievement: degree of emphasis on academic activities and the importance of excellence.
      (2) Affiliation: degree of interaction with students and emphasis on warm personal relationships.

(3) Control: degree to which the moment to moment behavior of students is controlled by the teacher.

(4) Recognition: degree to which the teacher is the center of attention.

Two means of assessing these dimensions were used. The first is based on sampling of the verbal behavior of the teacher; the second consists of observer ratings and elaborations thereof. Each of the participating teachers was visited in class by two members of the research team. After preliminary visits to reduce the effect of an observer, data collection was begun. Each teacher was visited at least three times by each observer. The following measures were obtained:

1. Verbal Statements. This technique requires the verbatim recording of teacher statements based on time sampling. The statements were subsequently categorized and categories combined so as to provide a frequency score of statements in four categories: controlling, affiliative, achievement, and management. Too few 'recognition' statements were recorded to warrant using this score.

2. Ratings. Each teacher was rated by each of two observers on a total of 35 dimensions gleaned from prior research. In the present study only ratings on the four dimensions of major interest (control, affiliation, achievement, and recognition) were used.

3. Q-sorts. Each teacher received a Q-sort based on a combined sort of two raters working together. Twenty-four characteristics, selected from the 35 used in the ratings, were sorted. A factor analysis of these sorts resulted in five factors as follows:

a. Cold, controlling vs. warm, permissive

b. Vigorous, dynamic vs. dull, quiet

c. Insecure, anxious vs. confident

d. Works alone vs. interactive

e. Much academic emphasis vs. little academic emphasis

Each teacher was assigned a score on each factor which was the sum of the Q-sort scores on the dimensions having highest loadings on each factor.

A detailed description of the need measures and the behavior measures may be found in our earlier report (Travers, Wallen, Reid, and Wodtke, 1961).

2. Teacher Measures Obtained During the Years 1961-1962.

a. OSCAR. This device, developed by Medley and Mitzel, has shown promise as a means of quantifying differences in teacher behavior. During each observation period the observer samples time periods of five minutes duration, alternating his focus of attention until a total of six periods (30 minutes) are completed. During half the period the observer records whether or not certain events occur, e.g., children are in small groups. During the other periods a frequency count is made of teacher statements classified in categories. Fourteen dimensions plus three factors are scored. The scores obtained were as follows. Certain specific categories were also analyzed.

Fourteen variables:

(1) Time spent on reading

(2) Frequency of problem structuring teacher statements

(3) Autonomous administrative groupings--groups set up by teacher for academic work

(4) Pupil leadership activities (frequency)

(5) Freedom of movement

(6) Manifest teacher hostility

(7) Supportive teacher behavior

(8) Time spent on social studies

(9) Disorderly pupil behavior (frequency)

(10) Verbal activities

(11) Traditional pupil activities (board work, recitation, reports)

(12) Teachers verbal output

(13) Audio-visual materials

(14) Autonomous social groupings

Factors

(1) Emotional climate (teacher hostility, disorderly behavior)

(2) Verbal emphasis (time spent on reading, verbal activities)

(3) Social structure (autonomous social groupings, teacher verbal output)

Each teacher was visited once by each of three observers. Two visits per observer were originally planned but time did not permit this much observation.

b. Q-sort. Inasmuch as a time period had elapsed since the previous Q-sort scores were obtained, and as a check on the original scores, each observer independently sorted the present sample of teachers on one of the variables which had been most promising in the prior study, i.e.,

affiliative behavior. The resulting correlation with previous scores was .57. Considering the fact that the observers making the second sortincluded one who had no prior contact with the teachers and two who had prior contact with approximately one-third of the teachers and that the observer time prior to sorting was limited to one observation of the teacher, this correlation indicates considerable stability of this dimension of teacher behavior. Subsequent selection of high and low controlling teachers as one phase of the study excluded those for whom disagreement between sorts was high. For this selected sub-sample the correlation between the two scrts was .87.

c. Pupil Measures. Immediately following the administration to the pupils of the Russell Sage Social Relations Test (discussed subsequently) the teacher's reaction was assessed after discussion on the part of the two observers. Each teacher was assigned a rating as follows:

(1) Extent of ego-involvement--4 point scale

1 = left room

2 = uninvolved

3 = mildly involved

4 = hihgly involved

(2) Extent of ego-involvement--2 point scale

1 = left room or uninvolved

2 = involved

(3) Nature of reaction

1 = strong disapproval

2 = mild

3 = neutral reaction

4 = mild positive reaction

5 = strong positive reaction

(4) Degree of defensiveness re class behavior

1 = none

2 = mild

3 = severe

Pupil Measures

During the academic year 1961-1962 a number of measuring devices were administered to all of the pupils (less absentees) of the 65 teachers. In addition, during the academic year 1962-1963 additional measures were administered to the pupils of a sub-sample of 19 of these teachers selected on the basis of extent of controlling behavior within the grades two through five. The measures obtained for these two groups of students are presented separately.

Pupil Measures Obtained During the Year 1961-1962--All Teachers

1. Intelligence. California Test of Mental Maturity--Short Form--Primary Level--in grades 1-3; Elementary Level in grades 4-5. Administered in the fall. Scores used: Language, Non-language, and Total.

2. Achievement. California Achievement Tests: Reading Vocabulary, Reading Comprehension, and Arithmetic Fundamentals. Administered fall and spring as follows:

	Fall	Spring
Grade I	Lower Primary Level	Lower Primary Level
Grade II	Lower Prkmary Level	Lower Primary Level
Grade III	Upper Primary Level	Elementary Level
Grade IV	Elementary Level	Elementary Level
Grade V	Elementary Level	Elementary Level

In addition to the pre- and post-test scores regressed gain scores were obtained for each pupil within each grade in each of the three achievement areas. Multiple regression equations were established within each grade using as predictive variables CMM total score and the pre-test on the appropriate achievement test. The predicted score was the end-of-year or spring score. Predicted scores were thus obtained for each student in each area and this score was then subtracted from his actual score providing a measure of gain.

3. "Creativity." The following tests developed by Torrance were used in the grades indicated. The scores derived from each are listed.

a. Incomplete Figures Test (Grades 1-5)

(1) Originality

(2) Closure

(3) Productivity

b. Circles Test (Grades 1-5)

(1) Relevance

(2) Redundance

(3) Ideational Fluency

(4) Flexibility

(5) Originality

c. Consequences Test (Grades 3-5)

(1) Fluency

(2) Flexibility

(3) Originality

4. Questionnaire. (Read orally--S responded yes or no to each item.) (Grades 1-5) With the exception of (a) and (h) these scales were constructed as part of the present project.

a. Sarason Test Anxiety Scale (30 items)

b. Dependency Need (10 items)

c. Affiliation Need (10 items)

d. Achievement Need (10 items)

e. Perception of teacher as warm, affiliative (5 items)

f. Perception of teacher as controlling (5 items)

g. Perception of teacher as emphasizing academic matters (5 items)

h. Liking for school (5 items) (Takin from 'My Class Inventory,' Medley and Klein, 1957)

Each of the preceding devices was administered to all children (less absentees) in the grade indicated. In addition, the Russell Sage Social Relations Test was administered in grades 2-5. This test requires the group to devise and execute a plan for construction of figures out of blocks to match paper templates. The scores obtained are as follows:

a. Planning Stage.

(1) Extent and quality of participation

(2) Quality of communication

(3) Quality of ideas

(4) Quality and precision of final plan

(5) Extent of involvement (as distinguished from active participation)

(6) Extent of group autonomy or independence from examiner

b. Operations Stage.

(1) Extent of involvement

(2) Atmoshpere (extent of hostility vs. cooperation)

(3) Activities of non-involved members

(4) Success or task accomplishment

The test as used in the present project departed from standardized procedure in two ways. First, time permitted using only two of the three problems. The second, and more serious departure arose from lack of clarity in the manual as to whether subjects are permitted to use more blocks if they so desire. Although one published article implies they are not, wehad previously made the contrary decision and allowed additional blocks to be used. It is likely that this affected the task in the following ways:

1. It fostered scrambling for blocks and hence greater disorder in some classes;

2. It permitted the children to set up competing groups (e.g., boys vs. girls) each of which worked on the design.

In general, our procedure seems less conducive to efficient, democratic procedures, making some of the group performances all the more striking in their adequacy of solution.

Pupil Measures 1962-1963--Selected Teachers

1. Intelligence. The Lorge-Thorndike non-verbal battery was administered during the month of January.

2. "Creativity" Scores. The following non-verbal measures were utilized in grades two through five: Picture Construction, Figure Completion, Circles. The verbal measures, which were utilized only in grades four and five, were as follows: Ask-and-Guess Test, Product Improvement, Unusual Uses, and Consequences. These measures were administered in the fall and again in the spring and regressed gain scores obtained. A multiple regression equation was obtained utilizing as predictors the intelligence test score and the pre-test creativity score and predicting the post-test creativity score. The predicted score was in the case of each pupil subtracted from the actual spring score giving a measure of gain on the test in question.

3. Measure of Pupil Classroom Behavior. A rating scale based on numerous earlier researches was devised which provides a measure of pupil behavior according to the following dimensions: Pupil questioning behavior, pupil academic behavior, management behavior, leadership behavior, non-conformity behavior, talk, grouping, pupil-teacher interaction, emotional behavior, pupil ideas, self-initiated pupil academic behavior, and self-initiated pupil non-academic behavior. This schedule was applied in observing a sample of 32 boys, four per classroom, selected so as to have two high and two low scorers on the "creativity" tests matched, with intelligence held constant.

The methods of analysis consited of: 1. obtaining intercorrelations among the various measures of teacher and pupil behavior utilizing mean scores per class for the measures of pupil behavior as indicative of teacher influence, and 2. factorial analysis of variance designs employing selected combination of teacher and pupil characteristics as main effects and other pupil measures, particularly gain scores as dependent

measures.

Summary of the Major Findings of Part I

It is clear that any conclusions arrived at as a result of a study such as this must be held quite tentatively. The first reason for this is that our sampling of teachers does not constitute a sample drawn randomly from teachers in general or even from teachers within the particular locale in which the study was conducted. We do have some confidence in generalizing results, at least within this geographical area, due to our attempt to obtain teachers from a number of schools and our evidence (from our earlier study) that the more important results pertaining to the prediction of teacher behavior were replicated with both sub-samples. Nevertheless, this caution should be kept in mind.

Secondly, most of the hypotheses which we originally developed and which were directly tested were not supported. Thus, we have in large measure resorted to an empirical examination of the many relationships possible within our matrix of variables. Although we have attempted to guard against capitalization on chance, there remains the possibility that some of our findings reflect nothing more than chance fluctuations. This problem is particularly evident when the relationships are examined within a particular grade with the smaller N which this necessitates. Unfortunately, within-grade analyses became imperative in this study due to the finding that one of our initial assumptions, i.e., that any relationships obtained between teacher characteristics and student characteristics would take essentially the same form across all five grades is, in many instances, apparently an incorrect assumption, although one cannot be sure whether it is the relationship between the fundamental variables

themselves which differs or whether certain aspects of the measurement procedures may have differed from grade to grade.

Nevertheless, it is possible to place our findings along a continuum of tentativeness and we shall first list those results which seem to us to have considerable support within our data, both in terms of consistencies across the five grades and in terms of the consistency of relationships among the variables themselves.

1. Achievement gain in Reading Vocabulary appears to be positively correlated with the extent to which the teacher is viewed as a stimulating teacher by observers. This relationship seems to exist within all five grades.

2. Liking for School appears to be related to a teacher orientation which is less achievement oriented as viewed by observers. It is probably to be expected that the teacher who makes the greatest achievement and academic demands on the student will engender the greater amount of frustration on the part of the poor students in particular, and hence, a somewhat less favorable attitude toward her and school in general.

3. Liking for School seems to be positvely related to the degree of warmth and permissiveness of the teacher in the upper grades. In the lower grades, and particularly in grade 1, this relationship is possibly reversed, although this finding is considered very tentative due to the complications in interpretation of the measure of permissiveness encountered in this grade.

4. The extent to which the teacher is viewed by observers as achievement oriented seems to have a positive affect upon the ability of the class to plan effectively in a group problem solving task, but also appears to foster a breakdown in group relationships in the actual

operations phase of the problem though this did not appear until the second of two problems was encountered.

5. Supportive behavior on the part of the teacher appears to foster a more friendly group interaction during the operations phase of group problem solving activity.

6. Supportive behavior on the part of the teacher appears to be negatively correlated with the extent of test anxiety within all five grades.

7. There appears to be a fair degree of correspondence between observer and pupil perception of the teacher in terms of extent of affiliation behavior beginning at about the third grade. In the first two grades this correspondence is extremely poor.

8. Speaking only of achievement gain in the three areas tested, it appears that some teachers do a better job of teaching reading, across all grades than others. Within the first grade, there is the suggestion that the teacher who fosters greater gain in Reading Comprehension also fosters greater gain in Arithmetic. This trend was also observed in the upper grades but may (in the upper grades) be attributable to differences in class intelligence.

9. Coefficients of stability for the Torrance creativity tests over a six-month period show greater stability in the higher grades and higher stability for the verbal than for the non-verbal measures. In grades four and five, the 'total' score in each area (verbal and non-verbal) provides stability coefficients of the magnitude of .60 to .75. In the lower grades (two and three) the non-verbal 'total' stability values are .46 and .34.

Next we may list a series of findings which we regard as even more tentative than those listed above.

1. It appears that the teacher who is excessively affiliative or affectionate in the first grade and who, in addition, has a strong need for affiliation is likely to be less well liked and to engender less of an achievement gain than the less affiliation oriented teacher, although hostility in the first grade on the part of the teacher appears undesirable. It appears that verbal supportive behavior, praise, and encouragement on the part of the teacher is quite important in the first grade, fostering both liking for school and gain in achievement. It also appears, however, that in the first grade the student may have need of considerable structure within the school environment such that the more controlled classroom and the controlling, somewhat aloof teacher may provide an environment within this grade which is more comfortable and more conducive to achievement for the first grade student. It would appear that the first grade teacher should provide a very well ordered, well organized classroom which does not permit much pupil decision but which is at the same time comforting and encouraging but not overtly affectionate.

2. There is the suggestion of an interaction between the teacher characteristics of control and the pupil characteristic of dependency in that within the first grade on the reading vocabulary measure the children who were high in dependency need, as measured by our questionnaire, did better with the more controlling teachers, whereas, the children who were low in dependency need did better with the less controlling teachers.

One analysis suggests the same effect to be true for arithmetic gain. There is the further suggestion that this relationship is reversed by the fifth grade in that the less dependent children achieved <u>less</u>

achievement gain in arithmetic with the less controlling teachers.

3. With respect to changes in creativity, at least as measured by the Torrance tests, there is some evidence that the more permissive teacher in the upper grades tends to foster a greater change in the direction of more originality of thinking than does the more controlling teacher.

4. There is the suggestion that pupils, at least in the upper grades, initiate more verbal exchange with the less controlling teacher.

5. On several fairly reliable indexes of pupil classroom behavior there was no indication of differing behavior on the part of 'high' and low 'creative' pupils.

In addition to the generalizations just discussed, it seems worth recording the overall impression which we are left with, an impression which, it should be recognized, would not necessarily be shared by other individuals working with the same data since it does not have clear-cut support from the data. Nevertheless, the impression is one of the importance of a developmental point of view with regard to teacher behavior across the first five grades. We have the distinct impression from our data that the typical first grader, being somewhat unsure of himself and new to the situation, is both more comfortable and achieves better given a situation which is quite structured, quite controlled by the teacher while at the same time being rather supportive and encouraging but without overt affection on the part of the teacher. Data which tend to support this are the preceding discussion of the results within grade one as well as the finding that this type of description seems to hold particularly true for the more dependent child. In about the second grade it is our impression that this pattern tends to change and that by the upper grades the general desirability of encouragement still exists but the effect of control shifts

such that a greater degree of permissiveness has the more desirable effects in terms of both liking for school and achievement gain.

Further, the totality of results strongly suggest that relationships between teacher characteristics and pupil behavior may be very different in the first one or two grades than for the succeeding grades. Since almost all research has been done using grades four and above (probably largely for reasons of convenience which we can well appreciate), we suggest that: (1) generalization below these grades is very questionable and (2) studies in the first grade seem imperative.

Analyses Conducted in the Present Study

Each of the succeeding chapters is devoted to a discussion of procedures and results of analyses carried as a part of the present project. One of the most interesting results of the preceding project, discussed above, was the seeming difference in impact of teacher control in the first grade as opposed to its impact in later grades, at least grades four and five. There were, however, some misgivings as to the measures of teacher control obtained in grade one. With regard to the total sample of teachers and also in each of grades two through five, there is good consistency among three measures of teacher control in the classroom: the measure of verbal statements recorded verbatim and subsequently categorized; the ratings made directly after class observation by observers; and factor scores based on Q-sorts obtained at a later date by the observers. In grade one, however, the intercorrelations among these measures are appreciably lower. For this reason, it was considered desirable to try to obtain additional evidence related to the control dimension, particularly within the first grade. To this end the classification of verbal

statements was redone to provide a somewhat more refined measure of controlling behavior as reflected in teacher statements and in particular to treat reprimands as a separate category of control. In addition, two other measures were included in this analysis. The first is a measure of extent of controlling and affiliative behavior on the part of the teacher as judged from drawings made by students of the teachers, and the second is an additional Q-sort made at a later time and by a different observer. These measures were then included as scores and the intercorrelations with the other measures of teacher and pupil behavior studied and reported in Chapter II.

Chapter III is devoted to a study of the effect of certain combinations of teacher characteristics and pupil characteristics and their interaction as affecting other measures of pupil behavior. The design of this study was very similar to studies conducted in Part I. However, in this approach categories with respect to both teachers and pupils were predicated on a prior study by Heil, et al. (1960) which appeared promising. Chapter IV is devoted to analysis of the interrelationships among the measures of pupil behavior themselves. Inasmuch as there were approximately 350 pupils tested in each of grades one through five, analysis of the interrelationships of the measures themselves is of considerable interest. These were studied in terms of first order correlations among the measures and factor analysis by grade. Chapter V briefly reports on relationships between gains achieved by the same teacher in the achievement areas during one year and gains on the tests of "creativity" in a subsequent year.

CHAPTER II

FURTHER ANALYSIS OF THE TEACHER MATRIX EMPLOYING ADDITIONAL MEASURES

One of the major analyses conducted in the prior study consisted of examining the intercorrelations among the various measures of teacher and pupil behavior through correlation matrices within each grade and across all five grades. In this matrix the measures of teacher characteristics are, of course, appropriate to each of the teachers studied. The pupil characteristics, however, consist of means for the class as a whole on the various measures, though these are for convenience referred to as teacher measures, they are infact measures appropriate to the students in a teacher's class which presumably are affected by the teacher characteristics. The present analysis was prompted by a lack of clarity as to the meaning of the Factor I or warmth-control dimension in the first grade. Across the five grades combined and also within each of the upper four grades the three measures of teacher classroom behavior pertinent to the dimensions of control and affiliation showed substantial agreement; thus, the teacher scoring high on Factor I was rated as less controlling and as more affiliative and the measure based on the verbatim recordings of teacher statements called teacher statements control correlated positively with the rating control and negatively with the Factor I score. In grade one, however, the internal consistency of these three measures was very poor. Since the Factor I measure showed very interesting correlations with measures of achievement gain in reading comprehension (-.66) and liking for school (-.51) within the first grade and significant

positive correlations with these measures in the higher grades, it was considered desirable to further clarify the meaning of Factor I within the first grade. To this end the following additional measures were employed:

1. The teacher statements control category was divided into sub-categories each of which consisted of combinations of scores emerging from the initial classification system of teacher statements described in our first report (Travers, et al., 1961). Our intention here was to distinguish essentially negative forms of control in the form of reprimands from more positive types of control. The scores utilized were (a) reprimands, i.e., statements directly reprimanding students individually or reprimanding the class as a whole and (b) positive control including statements directing the pupils or individual pupil to achieve a particular goal or perform a task either of an academic nature or of a classroom management nature such as "sit up," etc.

2. Scores on drawings made by pupils of their teacher and class. This technique is described in detail in a prior report (Travers, et al., 1961). The children were instructed to draw a picture of their class and their teacher and these drawings were subsequently scored in several ways, two of which are appropriate here--a score intended to reflect the child's perception of the teacher as a controlling teacher and a score intended to reflect the child's perception as a warm friendly approachable figure. These drawings were made by different pupils than the ones to whom the Pupil Measures refer in the present study.

3. Q-sort as to the extent of affiliative behavior on the part of the teacher made one to two years after the original Q-sorts. The original factor scores were based on Q-sorts obtained at the end of one year's

observation and work with the teacher according to a procedure described in a prior report (Wallen, 1963). It was of interest to note how much change in the Q-sort measures might occur one year later. Accordingly, after the year in which the data on pupils were collected, members of the project staff again Q-sorted the teachers on only one dimension, that of affiliative behavior. Thus, two Q-sort scores were available for each teacher; approximately half of these with a time interval of one year, for the others an interval of two years. The resulting correlation was .57 inspite of the fact that the observers differed considerably from one year to the next. For the present analysis each of these scores was included in the matrix.

In addition to these variables the correlation matrix consisted of the Q-sort factors, teacher ratings, teacher verbal statements, the test anxiety score, the questionnaire measures of pupil-teacher perception and pupil need, and the liking for school measure.

Results

Table 2.01 shows the correlation across grades between the Factor I measure, the rating control and rating affiliation measure, and the new scores introduced in the analysis. It must be kept in mind that with a sample size of approximately twelve teachers per grade, the sampling error associated with each of these correlations is very large. However, in grades three and four the Factor I scores are related as would be expected to both reprimand and positive control in that the teachers rated high exhibit fewer statements classified as reprimands and also as positive control. In grade five the picture is unclear and in grades one

and two it appears that the Factor I is more a reflection of the reprimand verbal behavior than of positive control statements. The rating control measure is positively correlated with reprimands as would be expected in grades two through five but inexplicably negatively correlated in grade one. The rating control and positive control statements correlate very low across all five grades. The overall impression is that the observer ratings and factors derived from Q-sorts are affected more by the negative statements of control made by the teachers than by positive control though it should be recalled that these observations would also be affected by non-verbal behaviors on the part of the teacher.

Looking next at the measures of perceived teacher control and affiliation as reflected in the pupil drawings we note that there is little correspondence to the original measures across the five grades and that in fact the measures are in the first grade related in the reverse of what would have been expected. Thus, those teachers viewed by the observers as less controlling and more affiliative are judged by the drawings to be perceived to be more controlling by the pupils and less affiliative. This makes sense, however, in light of our previous interpretation that the first grade pupils tend not to like the more warm permissive teacher as well and hence are drawing the more affectionate permissive teacher as both more objectionable and less approachable. Correlations between the drawing scores and the ratings on control are inconsistent and are of little help.

Looking next at the Q-sorts across the two different years, we note that with respect to both the Factor I measure and the control ratings as well as the affiliation ratings, the separate Q-sorts correlate, as would be expected, in that the Q-sorts and the factor scores derived in the

same year and hence in part as a result of these same sorts correlate very highly with them. When the factor scores are correlated with the sorts in the succeeding year, the correlations are lower but generally still substantial. The major exception being, once again, in the first grade where the Factor I score does not correlate significantly with the Q-sorts in the second year.

Table 2.02 presents the relationships between the new measures and the measures of pupil behavior. Looking first at liking for school, we note rather surprising results in that the liking for school measure seems to show very low correlations with the reprimands category with the exception of grade five wherein the correlation is substantial but in the opposite direction expected. With respect to liking and positive control the correlations are consistent with previous speculations in the upper grades where a negative correlation was expected but the correlation is also negative in the first two grades which is contrary to the previous speculation that the first grade pupils would have a preference for the more controlling teacher.

Looking next at the drawing measure we note that in the first grade there is considerable correspondence between the questionnaire measure and the drawings in that the teachers identified as better liked on the questionnaire received drawings which are scored as higher in affiliation and lower in control. This correspondence does not, however, exist in any of the other grades. The relationship with the Q-sorts is consistent with that previously studied and is not surprising since in the case of Q-1 it is based largely on the same data but shows the very striking trend, the teacher who is better liked in the first grade being the one viewed as less affiliative by observers; and this trend gradually

changing to the reverse in the higher grades. The same trend is maintained with the second Q-sort though with lower magnitude correlations.

With regard to test anxiety, there is a slight tendency toward a positive correlation with both reprimands and postive control in that eight of the ten correlations are positive and one is significant at the .05 level. For the most part, however, these relationships are unimpressive as are those with the drawing scores. There is a definite trend of negative correlations with the affiliation Q-sort obtained during the same year as the anxiety measure but much lower correlation with the affiliation Q-sort obtained the year before.

The next topic of interest is the achievemenr gains. There are no striking relationships or trends between the gain measures and the verbal reprimands category. With respect to the verbal statements positive control, very little occurs with respect to reading vocabulary gain or reading comprehension gain. However, with respect to arithmetic gain there is a possible trend in that the correlation in the first grade is a plus .16, which is of little consequence, but in the succeeding four grades the correlations are all negative ranging from -.13 in the fourth grade to a -.58 in the second grade suggesting that the amount of direction provided by the teacher, in general, has a negative relationship to the amount of gain in arithmetic in these grades. The drawings control score seems to provide nothing with respect to relationship with achievement gain. The drawings affiliation score tends to show correlations ranging from the twenties to the forties but inconsistent across grades and with no meaningful trends emerging. Neither of the Q-sorts, I or II, show any consistent relationships with the gain scores which is somewhat surprising in light of the previous findings with respect to the

TABLE 2.01

CORRELATIONS BETWEEN ADDITIONAL MEASURES OF TEACHER CHARACTERISTICS (RE-CATEGORIZED VERBAL STATEMENTS, DRAWINGS, AND Q-SORTS) AND THE ORIGINAL MEASURES (FACTOR I AND RATINGS--CONTROL AND AFFILIATION)

	Grades				
	I	II	III	IV	V
Factor I--Reprimands (V.S.)	-.47	-.51	-.58	-.33	.27
Factor II--Positive Control (V.S.)	.08	.04	-.47	-.48	-.12
Rating Control--Reprimands (V.S.)	-.54	.33	.30	.40	.26
Rating Control--Positive Control (V.S.)	-.04	.29	.24	.02	-.22
Rating Affiliation--Reprimands (V.S.)	-.35	-.12	-.35	-.30	-.17
Rating Affiliation--Positive Control (V.S.)	-.04	-.29	-.46	-.39	.20
Factor I--Drawings Control	.71	-.31	.16	-.19	-.33
Factor I--Drawings Affiliation	-.41	-.12	.28	-.09	.24
Rating Control--Drawings Control	-.22	-.08	-.38	-.10	.48
Rating Control--Drawings Affiliation	.48	.10	-.33	.40	-.40
Rating Affiliation--Drawings Control	.20	-.25	.39	-.42	-.30
Rating Affiliation--Drawings Affiliation	-.41	-.33	.38	.12	.52
Factor I--Affiliation Q-sort I	.87	.76	.82	.94	.91
Factor I--Affiliation Q-sort II	.15	.65	.60	.65	.65
Ratings Control--Affiliation Q-sort I	.16	-.41	-.71	-.58	-.47
Ratings Control--Affiliation Q-sort II	.01	-.02	-.47	-.45	-.48
Ratings Affiliation--Affiliation Q-sort I	.46	.58	.76	.50	.60
Ratings Affiliation--Affiliation Q-sort II	-.01	.37	.32	.07	.32

Note.--The standard error of r is $\approx$.30 in each grade.

TABLE 2.02

CORRELATIONS BETWEEN ADDITIONAL MEASURES OF TEACHER CHARACTERISTICS (RE-CATEGORIZED VERBAL STATEMENTS, DRAWINGS, AND Q-SORTS) AND CERTAIN PUPIL MEASURES (ANXIETY, LIKING FOR SCHOOL, ACHIEVEMENT GAINS)

	Grades I	II	III	IV	V
Anxiety--Reprimands	.18	.01	-.26	.72	-.05
Anxiety--Positive Control	.32	-.01	.29	.22	.03
Anxiety--Drawings Control	-.06	.34	.04	.27	-.13
Anxiety--Drawings Affiliation	.02	.20	-.06	.15	.07
Anxiety--Affiliation Q-sort I	-.03	.10	-.37	-.12	.00
Anxiety--Affiliation Q-sort II	-.28	-.16	-.24	-.33	-.46
Liking for School--Reprimands	-.13	.11	-.09	.07	.74
Liking for School--Positive Control	-.45	-.44	-.33	.32	-.47
Liking for School--Drawings Control	-.53	.27	.27	.66	-.23
Liking for School--Drawings Affiliation	.54	-.19	.08	-.43	.11
Liking for School--Affiliation Q-sort I	-.47	-.22	.20	.24	.64
Liking for School--Affiliation Q-sort II	-.27	-.09	.04	.34	.33
Reading Vocabulary Gain--Reprimands	-.04	-.11	-.07	.07	.33
Reading Vocabulary Gain--Positive Control	-.12	.14	.01	-.11	.08
Reading Vocabulary Gain--Drawings Control	-.39	-.07	.13	.28	.46
Reading Vocabulary Gain--Drawings Affiliation	-.31	-.12	.70	-.45	-.16
Reading Vocabulary Gain--Q-sort I	-.13	.27	-.08	-.18	-.37
Reading Vocabulary Gain--Q-sort II	.09	.19	.22	.16	-.26
Reading Comprehension Gain--Reprimands	.06	-.39	.32	.13	.57
Reading Comprehension Gain--Positive Control	.04	-.16	-.12	.23	.07

TABLE 2.02 (Continued)

CORRELATIONS BETWEEN ADDITIONAL MEASURES OF TEACHER CHARACTERISTICS (RE-CATEGORIZED VERBAL STATEMENTS, DRAWINGS, AND Q-SORTS) AND CERTAIN PUPIL MEASURES (ANXIETY, LIKING FOR SCHOOL, ACHIEVEMENT GAINS)

	Grades				
	I	II	III	IV	V
Reading Comprehension Gain--Drawings Control	-.36	.39	-.06	.33	-.10
Reading Comprehension Gain--Drawings Affiliation	-.08	-.23	.26	-.40	-.35
Reading Comprehension Gain--Q-sort I	-.49	.55	-.23	-.11	.47
Reading Comprehension Gain--Q-sort II	.44	.53	-.28	-.00	.87
Arithmetic--Reprimands	.02	-.38	-.24	.26	.17
Arithmetic--Positive Control	.16	-.58	-.30	-.13	-.34
Arithmetic--Drawings Control	-.23	.15	-.19	.04	.19
Arithmetic--Drawings Affiliation	-.08	.06	-.03	-.38	-1.00
Arithmetic--Q-sort I	-.23	.26	.06	-.23	-.51
Arithmetic--Q-sort II	.43	.03	.30	-.40	.20

relationships with the Factor I score which is interpreted as being, in large part, an affiliation score.

In summary, the re-analysis has not proved as profitable as we hoped it would be. We had hoped that the finding that, in the first grade, the teachers rated high in Factor I (i.e., those teachersviewed as toward the warm permissive end of the scale) were both less well liked by the children and achieved less achievement gain in reading comprehension would be further clarified by these analyses. Our earlier interpretation to the effect that the first grader preferred a more structured situation is somewhat weakened by these data due to the negative correlation between liking for school and our measure of positive control and we are at this point inclined more toward an interpretation that it is the excessive affiliation on the part of the first grade teacher which is disliked. It appears that the only approach to further clarification of these very interesting relationships will require collection of additional data on larger samples of teachers within grades and particularly within the first grade.

CHAPTER III

THE INTERACTION OF TEACHER-PUPIL CHARACTERISTICS AS AFFECTING PUPIL PERFORMANCE

Sub-samples of 48 teachers and 656 pupils were selected for further analysis of the effects of teacher characteristics on pupil behavior. Teachers were profiled according to their scores on the Teacher Preference Schedule primarily, and placed into three groups described by Heil, et al. (1960): controlling, turbulent, and fearful. All three teacher-types were represented at each of grades one through five. Pupils were profiled according to their scores on four personality measures (anxiety, dependency, affiliation, and achievement), and placed into three groups described by Heil et al. (1960): strivers-conformers, waverers, and opposers. Children representing each pupil-type were sampled from each teacher. Sixty-four analyses of variance were carried out comparing pupil- and teacher-types with respect to possible interaction effects reflected in achievement gain and creativity measures available on the pupils. Whereas the general objective of the present investigation has been to explore the relationships between various teacher characteristics and a range of measures of student behavior, a more specific objective of an earlier phase of this study was to test for possible interactions between levels of teacher classroom control and pupil personality measures such as anxiety, dependency, achievement needs, etc. (Wallen, N. E. and Wodtke, K. H., 1963). The productive results accruing from this latter phase of data analysis has suggested the goal of the present phase of this investigation, which is to expand upon the factorial analyses of the earlier

phase of hopes of plotting further interaction between levels of various teacher characteristics and of pupil behavior. The direction of these continued analyses has been largely suggested by the work of Heil, et al. (1960) who focused primarily on the measurement of teacher and pupil variables as well as on the effects of teacher behavior and personality on pupil achievement and friendliness gains. However, these investigators did not explicitly explore possible interactions between teacher and pupil personality measures, even though such interactions are indicated in their data through visual inspection.

The present study differs from that of Heil's in several respects. To begin with, the Heil study was primarily concerned with identifying meaningful teacher and pupil behavior and personality variables in order to explore the effects of the teacher upon the pupil. The differential effectiveness of Heil's three teacher-types across four pupil-types strongly suggests important interaction effects between teacher- and pupil-types, and the present study has been designed to explore these possible interactions. Also, the present study is attempting to reconstitute the various Heil teacher- and pupil-types on the basis of different though similar personality measures. Finally, the present study is concerned with the effects of teacher personality on pupil behavior with respect to various creativity measures and achievement gains, whereas the Heil study used as dependent measures achievement gains and gains in pupil friendliness.

Dependent Variables

The purpose of the present design is to test for possible interaction effects between pupil- and teacher-types as reflected in pupil achievement gain and creativity measures. Achievement gain scores were

available on all pupils over the five grades, and were obtained through fall and spring testing on the various levels of the California Achievement Tests (see Wallen and Wodtke, 1963). The three achievement gain scores included arithmetic, reading vocabulary, and reading comprehension.

Creativity measures used were those developed by Torrance, et al. (1960) and include the Incomplete Figures Test and Circles Test (grades 1-5), and the Consequences Test (grades 3-5). These tests represent a non-verbal creativity battery, and were scored as follows:

1. Incomplete Figures Test (Grades 1-5)
    a. Originality
    b. Closure
    c. Productivity
2. Circles Test (Grades 1-5)
    a. Relevance
    b. Redundance
    c. Ideational Fluency
    d. Flexibility
    e. Originality
3. Consequences Test (Grades 3-5)
    a. Fluency
    b. Flexibility
    c. Originality

Selection of Pupil Types

Heil, et al. (1960) were able to group their sample of 769 fourth through sixth grade children into four general personality clusters. These personality types are summarized as follows on the basis of responses to

a group test requiring answers to questions following presentation of taped 'unfinished' stories:

Group A (Conformers). This group is characterized by conformity to and incorporation of adult standards; social orientation with high affiliative needs; emphasis on mature, responsible behavior with little expression of dependency needs; adequate self-esteem and confidence with little manifest fearfulness, exhibitionism, or excessive need for overt competition; good impulse control in general and particularly over hostility.

Group B (Opposers). Characteristic of this personality type were individuals who reflected disturbed authority relationships and who showed oppositional, hostile, and non-submissive tendencies; feelings of helplessness and inadequacy, although strong denial of dependency needs; exhibitionism and hypochondraiacal complaint; low achievement needs and poor intellectualization as a defense mechanism; intolerance of ambiguity and attempted avoidance of guilt and shame; and a pervasive pessimistic tone, along with the functioning of disappointment and frustration as important dynamics.

Group C (Waverers). Generally true for this group of children were such dynamics as a high anxiety level along with pervasive anger and fearfulness, and a sense of inadequacy regarding social relations and achievement; floundering, indecision, general ambivalence, and ambivalence regarding interpersonal relationshipships; trouble with authority and unfulfilled dependency needs; and strong sub-surface feelings with little denial, rationalization, etc., to handle the emotional flood.

Group E (Strivers). As the label indicates, this group of children was characterized by strong achievement orientation, drive for recognition,

strong exhibitionistic needs, and ample self-confidence; good authority adjustment to adult standards; an average adjustment with respect to self-control in general and control of hostility feelings in particular; low anxiety and negligible inadequacy feelings; and relatively non-infantile mechanisms in the case of threat. These children are much like the conforming children.

To reconstitute the four Heil pupil-types for the present study, four personality measures available on each child from an earlier phase of this investigation were used. These measures included the Sarason Test Anxiety Scale and specially constructed scales measuring dependency, affiliation, and achievement needs.

High-low evaluations on the four personality dimensions for the four Heil groups led to the following profile patterns:

	Anxiety	N Dependence	N Affiliation	N Achievement
Conformers (Group A)	low	low	high	high
Strivers (Group E)	low	low	high	high
Opposers (Group B)	high	low	low	low
Waverers (Group C)	high	high	low	low

Since the conforming and striving children could not be clearly differentiated on the basis of these four personality measures, all analyses were carried out with these two groups combined.

With the criteria for approximating the Heil groups established, the task of selecting specific pupils for the analyses was undertaken. From a pool of over 2,000 children, 656 were eventually included in the final sample. The idea was to select from the classes of each of the 48 teachers included in the design, a representative sample from each of the

major pupil profile groups. Twelve pupils were chosen for each teacher, four pupils from each of the three profile groups who best fit their particular profile pattern. One particular difficulty arose, and the minimum anticipated N of 576 (58 teachers x 12 pupils) was increased to 656. The additional 80 students represented substitutions due to missing data on the dependent measures for the analyses for the original 576 pupils selected. Tables 3.01-3.05 give mean personality measure scores for the three pupil groups for each type of teacher (see section on teacher selection) and for combined teacher types for each grade. All mean criterion scores are based on the complete N of 656 pupils. As can be seen from visual inspection of Tables 3.01-3.05, some measure of success was obtained in differentiating the three pupil groups on the basis of their mean scores on the four criterion personality measures.

Selection of Teacher Types

Heil, et al. (1960) described three major teacher personality types which they were able to use successfully in their research design. These types were based on a questionnaire measure of interests and preferences. These personality types are described as follows:

Profile A (Turbulent). The turbulent teacher cluster was characterized by near-surface aggressive (and sexual) impulses; manifest tension, anxiety, guilt, and authority conflict; lack of need for affiliation, identification, or leadership; lack of orderliness, but a need for system and routine; bluntness and uninhibited behavior toward others; creative potential and need for independent, unconventional, and uninhibited thinking, especially well-suited for non-personal academic fields; and status-striving, exhibitionism, and critical attitude towards others (as opposed to high acceptance of own impulses).

TABLE 3.01

MEAN SCORES ON THE FOUR PERSONALITY MEASURES SERVING AS CRITERIA FOR SELECTION OF THREE PUPIL TYPES ACROSS THREE TEACHER TYPES AND FOR COMBINED TEACHER TYPES FOR GRADE ONE

Criterion Selection Measure		Anxiety	Dependence	Affiliation	Achievement	N
Total Sample[a] Mean		8.84	6.54	5.27	6.12	
Total Sample[a] S.D.		5.89	2.83	3.40	4.42	
Teacher Type	**Pupil Type**					
Controlling N = 3	Striver-Conformer	5.93	6.29	6.57	7.50	14
	Opposer	12.25	5.50	5.19	5.25	16
	Waverer	12.00	8.40	4.73	5.67	15
Turbulent N = 3	Striver-Conformer	6.21	6.64	5.86	6.71	14
	Opposer	13.69	5.23	4.69	5.38	13
	Waverer	12.54	7.69	5.15	5.62	13
Fearful N = 3	Striver-Conformer	5.75	5.92	6.17	7.50	12
	Opposer	11.31	5.54	4.38	5.54	13
	Waverer	12.00	6.77	4.62	5.46	12
All Teachers N = 9	Striver-Conformer	5.69	6.00	6.10	6.88	40
	Opposer	12.40	5.43	4.79	5.38	42
	Waverer	12.48	7.85	4.95	5.72	40
						122

[a]Refers to sample of better than 2,000 children from grades 1-5 from which smaller samples for this study were drawn.

TABLE 3.02

MEAN SCORES ON THE FOUR PERSONALITY MEASURES SERVING AS CRITERIA FOR SELECTION OF THREE PUPIL TYPES ACROSS THREE TEACHER TYPES AND FOR COMBINED TEACHER TYPES FOR GRADE TWO

Criterion Selection Measure		Anxiety	Dependence	Affiliation	Achievement	N
Total Sample[a] Mean		8.54	7.10	5.84	6.92	
Total Sample[a] S.D.		6.67	4.48	3.04	3.47	
Teacher Type	**Pupil Type**					
Controlling N = 3	Striver-Conformer	4.29	7.07	7.07	8.36	14
	Opposer	14.54	5.38	5.46	5.23	13
	Waverer	12.88	8.25	5.69	6.75	16
Turbulent N = 3	Striver-Conformer	3.42	6.25	7.17	8.00	12
	Opposer	11.56	6.31	5.56	7.19	16
	Waverer	12.64	8.36	5.57	6.07	14
Fearful N = 3	Striver-Conformer	5.46	6.54	6.85	7.92	13
	Opposer	13.08	6.50	4.92	6.83	12
	Waverer	12.25	8.67	5.67	6.17	12
All Teachers N = 9	Striver-Conformer	4.41	6.61	7.03	8.10	40
	Opposer	12.95	6.07	5.34	6.46	42
	Waverer	12.62	8.40	5.64	6.36	40
						122

[a]Refers to sample of better than 2,000 children from grades 1-5 from which smaller samples for this study were drawn.

TABLE 3.03

MEAN SCORES ON THE FOUR PERSONALITY MEASURES SERVING AS CRITERIA FOR SELECTION OF THREE PUPIL TYPES ACROSS THREE TEACHER TYPES AND FOR COMBINED TEACHER TYPES FOR GRADE THREE

Criterion Selection Measure		Anxiety	Dependence	Affiliation	Achievement	N
Total Sample[a] Mean		11.29	6.94	5.73	7.04	
Total Sample[a] S.D.		3.57	5.93	3.50	3.61	
Teacher Type	Pupil Type					
Controlling N = 4	Striver-Conformer	6.78	5.83	6.83	8.06	18
	Opposer	14.63	5.37	4.74	6.16	19
	Waverer	16.10	8.14	5.10	6.05	21
Turbulent N = 4	Striver-Conformer	7.00	6.78	6.39	8.44	18
	Opposer	15.28	5.50	5.50	6.28	18
	Waverer	16.53	8.41	5.71	6.53	17
Fearful N = 4	Striver-Conformer	6.28	6.56	6.44	8.72	13
	Opposer	16.76	5.94	5.41	6.12	17
	Waverer	17.50	8.22	5.78	6.61	18
All Teachers N = 12	Striver-Conformer	6.69	6.39	6.56	8.41	40
	Opposer	15.70	5.59	5.20	6.19	42
	Waverer	16.68	8.25	5.50	6.38	40
						164

[a]Refers to sample of better than 2,000 children from grades 1-5 from which smaller samples for this study were drawn.

TABLE 3.04

MEAN SCORES ON THE FOUR PERSONALITY MEASURES SERVING AS CRITERIA FOR SELECTION OF THREE PUPIL TYPES ACROSS THREE TEACHER TYPES AND FOR COMBINED TEACHER TYPES FOR GRADE FOUR

Criterion Selection Measure		Anxiety	Dependence	Affiliation	Achievement	N
Total Sample[a] Mean		12.18	6.29	5.70	7.00	
Total Sample[a] S.D.		6.63	3.80	3.89	5.04	
Teacher Type	**Pupil Type**					
Controlling N = 4	Striver-Conformer	5.95	6.10	6.80	8.40	20
	Opposer	16.55	5.25	5.55	6.55	20
	Waverer	16.78	7.89	5.17	6.33	18
Turbulent N = 4	Striver-Conformer	8.76	5.94	6.65	8.41	17
	Opposer	17.15	4.55	4.50	5.55	20
	Waverer	14.47	7.88	5.65	6.53	17
Fearful N = 4	Striver-Conformer	6.79	5.42	6.47	7.89	19
	Opposer	17.05	5.05	4.79	6.16	19
	Waverer	16.90	8.10	5.45	5.80	20
All Teachers N = 12	Striver-Conformer	7.09	5.82	6.64	8.23	40
	Opposer	16.92	4.95	4.95	5.80	42
	Waverer	16.11	7.96	5.42	6.20	40
						170

[a] Refers to sample of better than 2,000 children from grades 1-5 from which smaller samples for this study were drawn.

TABLE 3.05

MEAN SCORES ON THE FOUR PERSONALITY MEASURES SERVING AS CRITERIA FOR SELECTION OF THREE PUPIL TYPES ACROSS THREE TEACHER TYPES AND FOR COMBINED TEACHER TYPES FOR GRADE FIVE

Criterion Selection Measure		Anxiety	Dependence	Affiliation	Achievement	N
Total Sample[a] Mean		11.94	5.69	5.91	7.32	
Total Sample[a] S.D.		7.01	8.53	1.96	5.58	
Teacher Type	Pupil Type					
Controlling N = 2	Striver-Conformer	7.62	5.12	7.12	8.88	8
	Opposer	16.22	3.22	5.78	5.22	9
	Waverer	17.11	6.89	6.11	5.44	9
Turbulent N = 2	Striver-Conformer	5.22	4.44	6.22	8.11	9
	Opposer	15.00	4.44	5.33	6.11	9
	Waverer	19.12	7.50	5.75	5.88	8
Fearful N = 2	Striver-Conformer	6.00	5.50	6.62	8.38	8
	Opposer	16.00	4.22	5.67	6.89	9
	Waverer	19.22	7.78	5.11	6.11	9
All Teachers N = 6	Striver-Conformer	6.24	5.00	6.64	8.44	40
	Opposer	15.74	3.96	5.63	6.07	42
	Waverer	18.46	7.38	5.65	5.81	40
						170

[a]Refers to sample of better than 2,000 children from grades 1-5 from which smaller samples for this study were drawn.

Profile B (Self-Controlling). This personality type was known by its need for method, order, cleanliness, self-severity, impulse-control, and non-aggression. Also characteristic are high ambition, leadership, controlling and authoritarian tendencies; rigidity and severe conscience; responsible, hard-working, but non-creative or brilliant features; and affiliation and acquiescence to authority.

Profile C (Fearful). This group of teachers has been characterized by pervading fearfulness of their general environment and their impulses (sexual), hence their dislike for being alone, their need for cleanliness, law and order, and severe conscience; feelings of helplessness and strong dependency needs; often severe constriction, rigidity, and achievement immobilization; exhibitionism, nurturance, and nondirective tendencies with children especially.

These three Heil teacher-types were reconstituted for the present study on the basis of available personality data on each teacher from two sources existing from earlier phases of the present study. The first of these was the Teacher Preference Schedule (TPS) of Stern and Masling (1958, 1960). The TPS had been used earlier to rate each teacher on ten original plus four additional scales measuring underlying motivational tendencies.

Because an important personality measure was still lacking, one providing an index of fearfulness, neuroticisms, or ego-strength, another measure available on all teachers but not of the TPS family of scales was added. The ego-strength measure was a factor score derived from Q-sorts by four observers for each teacher on 24 personality variables. The ego-strength measure provided an index of the amount of confidence-uncertainty, ego-strength-neuroticism, and emotional frustration for each teacher (see

Travers, et al., 1961; Wallen, et al., 1963).

High-low evaluations on 11 personality scales for the three teacher-types were made as follows:

Personality Scales	Teacher Personality Types		
	Self-Controlling	Turbulent	Fearful
Ego-Strength[a]	H	H	L
Control[b]	H	L	L
Achievement	H	L	L
Affiliation	H	L	-
Recognition	L	H	H
Orderliness[c]	H	L	H
Status-Striving	H	H	L
Non-Directive	L	H	H
Rebellious	L	H	L
Dependence	H	L	H
Practical	H	L	L

[a]Factor scale derived from observer Q-sorts.
[b]TPS scales specially constructed.
[c]Original TPS scales.

The rationale for the use of the TPS as the principle device to reconstitute the three Heil teacher profiles seemed well-founded. In fact, the Heil, et al. (1960) study, itself, provided the basis for the use of the TPS as the principle criterion index. Heil and his associates compared their three major teacher clusters with the three teacher personality clusters described by Stern and Masling on the basis of findings supplied by the TPS. The comparison as made by Heil et al. (1960) are as follows:

Heil et al. (1960) Teacher Profiles	Stern and Masling (1960)	
	Teacher Clusters	TPS Scales
Profile B (Self-Controlling)	Teacher-Centered	Practical Dominant Orderly Dependent
Profile C (Fearful)	Children-Centered	Exhibitionistic Nurturant Pre-Adult Fixated Nondirective
Profile A (Turbulent)	--	Status-Striving Critical Exhibitionistic

Goodness of fit between the first and third cluster sets is noted to be close. However, Stern and Masling's children-centered cluster was seen to differ from Heil's fearful group with respect to the fearfulness and anxiety characteristics of the Heil teacher-type. For this reason, in the present study, the ego-strength-neuroticism factor score was added to the TPS scales. With this latter measure added, it was felt that reconstitution of the Heil teacher groups on the basis of the Stern and Masling TPS index could be made with reasonable success.

With the TPS profiles established for reconstituting each of the Heil teacher groups, 59 teachers available over grades one through five were evaluated for their TPS profiles. Of the 59, 48 were selected: nine each from grades one and two, 12 each from grades three and four, and six from grade five. The three teacherprofiles were represented at each grade level. Table 3.06 contains mean scores on the TPS and factor scales which were used as criterion measures in matching teachers to the three Heil clusters for each grade and for grades one through five combined.

As with the reconstitution of the pupil groups, a fair degree of goodness of fit was achievement in finding teachers from each grade to fit the three personality profiles. It is noted, however, that three of the 11 criterion variables did not hold up in the predicted directions once the teachers were selected. These were dependence, affiliation, and recognition. No explanation is available for these three variables, except to say that admittedly the sampling is smaller than would be desired (N = 48), and that the sample of 48 teachers was taken from a larger sample of only 59 teachers. However, in view of the fact that the 48 teachers fit the three profiles as well as they do seems to speak well for the basic teacher-types as they have been defined by both Heil and by Stern and Masling.

Results

General Design of Analyses

The design of the factorial variance analyses permits investigation of the relationships between the dependent creativity and achievement gains measures and the teacher- and pupil-types which served as independent measures. Since specific teachers were chosen for these analyses, there was a third effect in the designs, that of teachers nested within teacher-types. All nested and main effects represented fixed effects, and consequently all F-tests were run with the residual term as the error term.

There were 64 analyses of variance carried out, one for each of the 11 creativity and the three achievement gains measures for each grade, with the exception of the three Consequences Test categories for grades one and two. The general model for the 64 analyses was as follows:

TABLE 3.06

MEAN CRITERION PERSONALITY MEASURE SCORES FOR THREE TEACHER-TYPES FOR EACH GRADE AND FOR ALL GRADES COMBINED

Criterion Selection Measure			Ego Str.	Con.	Ach.	Order.	Status	Nondir.	Rebel.	Dep.	Prac.	Aff.	Recog.	N	N Avail. Tchrs.
Total Sample[a] Mean			12.23	54.34	56.35	37.57	44.08	48.25	36.51	37.57	35.66	67.71	68.39	$\bar{X}$	
Total Sample[a] S.D.			4.09	9.42	8.24	8.77	7.14	5.57	10.03	6.54	7.58	9.70	8.29	σ	
Grade	Teacher Type	N													
	Controlling	3	14.00	60.00	60.33	44.33	47.00	44.00	35.67	37.67	36.00	73.00	71.67		
1	Turbulent	3	17.33	44.33	49.00	34.33	45.00	50.33	37.00	39.33	37.33	62.33	64.67		
	Fearful	3	8.67	54.00	62.33	43.67	44.67	50.00	44.00	43.33	36.67	69.67	72.33	9	11
	Controlling	3	16.67	57.00	59.00	38.00	44.33	35.67	43.00	36.33	32.67	75.00	71.00		
2	Turbulent	3	16.00	48.00	50.00	38.00	45.33	45.33	41.00	39.67	30.67	70.00	77.00		
	Fearful	3	9.33	52.67	51.67	41.33	44.67	44.00	23.67	34.67	33.00	63.67	66.33	9	15
	Controlling	4	11.75	58.25	64.25	41.50	45.00	49.00	27.25	39.75	34.00	71.50	77.25		
3	Turbulent	4	17.00	43.75	52.50	34.50	42.50	50.00	36.75	35.50	33.75	69.00	66.50		
	Fearful	4	6.75	60.50	51.75	43.25	43.75	44.00	33.50	37.25	35.25	66.75	68.00	12	15
	Controlling	4	13.00	68.00	63.00	47.75	43.50	44.75	32.00	39.50	41.25	66.25	65.75		
4	Turbulent	4	13.50	52.00	60.75	39.75	45.00	48.00	40.50	39.50	33.50	72.50	66.25		
	Fearful	4	9.50	48.25	53.00	36.75	40.00	48.25	38.25	33.50	28.50	62.00	63.50	12	14
	Controlling	2	13.50	59.50	49.00	38.50	41.50	43.00	32.00	40.00	46.50	53.50	60.50		
5	Turbulent	2	15.00	47.50	54.50	27.50	50.50	50.00	29.50	33.50	37.00	58.00	71.50		
	Fearful	2	8.50	52.50	52.50	44.00	51.50	44.00	44.50	42.00	37.00	61.50	68.00	6	10
		48												48	65
	Control	16	13.625	60.937	60.312	42.562	44.438	43.688	33.562	38.625	37.500	64.500	69.375		
All	Turbulent	16	15.750	47.125	53.625	35.562	45.125	48.688	37.938	37.750	34.188	67.438	68.688		
Grades	Fearful	16	8.438	53.750	54.062	41.062	44.125	46.188	36.188	37.562	33.625	64.812	67.375		

[a]Refers to sample of better than 2,000 children from grades 1-5 from which smaller samples for this study were drawn.

Source of Variance

Pupil:
Pupil Types (AE, B, C)

Teacher:
Teacher-Types (A, B, C)
Teachers nested within Teacher-Types

Pupil-Teacher Interactions:
Pupil-Types x Teacher-Types
Pupil-Types x Teachers nested within Teacher-Types

Residual

Table 3.07 represents a summary of the F-rations (greater than 1.000) and degrees of freedom for pupil-types (P), teacher-types (T), and pupil x teacher interactions (T x T) on the 11 creativity and three achievement gains measures for grades one through five.

The Effects of Pupil-Types on Pupil Creativity as Measured by the Torrance Tests.

The analyses of the creativity measures produced the following distribution of significant pupil-types main effects out of 49 F-tests run over the five grades:

	Grade 1	2	3	4	5	Total F-tests Run
Incomplete Figures (3 measures)	0	0	0	0	0	15
Circles (5 measures)	0	1	0	0	0	25
Consequences (3 measures)	-	-	0	3	0	9
Total F-tests Run	3	3	11	11	11	49

The total of four significant F-tests cut of 49 run on the pupil-types main effects appears barely above chance level. However, it should be noted that all three Consequences Test scales (fluency, flexibility,

TABLE 3.07

F-RATIOS FOR PUPILS (S), TEACHERS (T), AND PUPIL BY TEACHER INTERACTIONS (S x T) ON ELEVEN CREATIVITY AND THREE ACHIEVEMENT-GAIN MEASURES FOR GRADE ONE THROUGH FIVE

(d.f.)	Grade 1 S (2/81)	Grade 1 T (2/81)	Grade 1 S x T (4/81)	Grade 2 S (2/81)	Grade 2 T (2/81)	Grade 2 S x T (4/81)	Grade 3 S (2/108)	Grade 3 T (2/108)	Grade 3 S x T (4/108)	Grade 4 S (2/108)	Grade 4 T (2/108)	Grade 4 S x T (4/108)	Grade 5 S (2/54)	Grade 5 T (2/54)	Grade 5 S x T (4/54)	
I.F.																
Originality	1.984	3.066[e]	-----	1.753	2.401	2.319[e]	1.044	-----	1.244	-----	-----	-----	-----	1.640	-----	
Closure	-----[a]	-----	-----	-----	-----	1.779	-----	-----	1.699	-----	1.236	-----	-----	4.373[d]	-----	N = 1 (2)
Productivity	1.619	-----	-----	1.480	2.402	-----	-----	2.083	-----	-----	-----	-----	-----	-----	-----	
Circles																
Relevance	1.136	-----	-----	1.949	2.508	1.593	-----	1.282	-----	-----	-----	-----	-----	-----	-----	
Redundancy	-----	-----	1.040	-----	1.448	-----	-----	-----	-----	-----	1.192	-----	-----	1.243	-----	
Fluency	-----	-----	-----	1.943	1.707	2.550[d]	-----	-----	-----	-----	1.202	-----	-----	1.167	-----	
Flexibility	-----	-----	-----	5.176[c]	1.662	-----	2.221	1.916	-----	-----	1.800	-----	1.574	-----	-----	N = 2
Originality	1.295	-----	-----	1.751	-----	-----	-----	-----	1.273	-----	-----	-----	1.660	-----	-----	
Consequences																
Fluency	-----	-----	-----	-----	-----	-----	1.357	1.605	2.273[e]	5.144[c]	3.066[e]	3.782[c]	2.282	-----	1.154	
Flexibility	-----	-----	-----	-----	-----	-----	-----	1.180	2.369[e]	4.688[d]	1.868	3.427[d]	2.099	-----	1.585	N = 5 (5)
Originality	-----	-----	-----	-----	-----	-----	1.126	1.728	2.074	9.077[c]	1.118	2.429[e]	2.825[e]	-----	1.500	
Gains																
Arithmetic	-----	27.033[b]	-----	-----	1.158	1.157	-----	2.046	1.142	-----	5.403[c]	-----	1.681	-----	-----	
Rdg. Vocabuc.	-----	-----	-----	-----	1.193	-----	-----	-----	1.468	2.786[e]	-----	-----	1.553	-----	-----	N = 5 (1)
Comprehension	2.300	4.716[d]	-----	1.359	-----	1.547	1.184	7.085[b]	-----	-----	2.663	-----	-----	-----	2.983[d]	
Sig. .05	3.124	3.124	2.498	3.124	3.124	2.498	3.098	3.098	2.461	3.098	3.098	2.461	3.175	3.175	2.549	
F-ratio .01	4.914	4.914	3.593	4.914	4.914	3.593	4.825	4.825	3.514	4.825	4.825	3.514	5.038	5.038	3.703	
Values .001																

[a] 1.000
[b] $p < .001$
[c] $p < .01$
[d] $p < .05$
[e] $p > .05$ (trend)

Note: Values less than one have been omitted.

and originality) at grade four yielded significant F's, two at the .01 level. The fourth significant F, for the flexibility scale of the Circles Test at grade two was also significant at the .01 level. Consequently, these results are interpreted as being well above a chance level of occurrence. However, it is not altogether clear as to the reasons for the inconsistency of these results with respect to significant results found at some grade levels but not at others. The means of the significant analyses for the three pupil-types are shown in Table 3.08.

It can be seen from the means in Table 3.08 that for the analyses where the three pupil-types differed significantly with respect to their performance on the creativity measures, the conformers-strivers repeatedly showed highest performance and the opposers consistently showed poorest performance of the three groups. It is interesting to note that this relationship holds up across grades two and four.

Three Effects of Teacher-Types on Creativity as Measured by the Torrance Tests.

The analyses of the creativity measures resulted in only one significant teacher-types main effects out of the 49 F-tests run over the five grades.

At grade five, the closure scale of the Incomplete Figures Test provided a significant F at the .05 level. The means for the three teacher-types from this significant analyses are reported in Table 3.09

These results from Table 3.09 tentatively suggest that the fearful teacher has a negative affect on pupil creativity.

The Effects of Pupil-Teacher Interactions on Creativity as Measured by the Torrance Tests.

Of this set of 49 analyses, three significant F-tests were produced

TABLE 3.08

MEANS OF THE FOUR SIGNIFICANT CREATIVITY ANALYSES FOR THE THREE PUPIL TYPES

Variables	N Each Pupil Group	Conformers-Strivers (AE)	Opposers (B)	Waverers (C)
Circles (Grade 2)				
Flexibility	36	7.861	6.139	6.889
Consequences (Grade 4)				
Fluency	48	4.146	3.062	3.604
Flexibility	48	3.375	2.625	3.000
Originality	48	1.979	0.917	1.333

TABLE 3.09

MEANS OF PUPIL CREATIVITY MEASURES FOR TEACHER TYPES

Variable	Teacher Types*		
	Turbulent (A)	Self-Controlling (B)	Fearful (C)
Incomplete Figures (Grade 5)			
Closure	23.88	23.50	20.08

*N = 24 each group.

for pupil-teacher interactions effects which bear a strong similarity to the distribution of results for the pupil-types main effects. Significant results were obtained again at grade four on the Consequences Test, and also at grade two on the Circles Test. Some interesting comparisons between the three interactions can be noted from the means of Table 3.10.

Visual analysis of these results across grades suggests that the opposing pupil responds best to the fearful teacher and that the conformer-striver responds best to the turbulent teacher. Other teacher-pupil relationships tend to vary across grades.

The Effects of Pupil-Types, Teacher-Types, and Pupil-Teacher Interactions on Pupil Achievement Gains as Measured by the California Achievement Tests.

The analyses of the achievement gains measures produced no significant pupil-types main effects. However, there were four significant F-tests out of 15 for teacher-types main effects:

	Grade					
Achievement Gains	1	2	3	4	5	Total F-tests Run
Arithmetic	1	0	0	1	0	5
Reading Vocabulary	0	0	0	0	0	5
Reading Comprehension	1	0	1	0	0	5
Total F-tests Run	3	3	3	3	3	15

There was also one significant interaction of 15 between pupil and teacher main effects.

Like the results produced on the creativity measures, the achievement gains results are rather spotty. Table 3.11 gives the means for the three teacher-types for all grades on the three achievement gains measures.

The two significant comprehension results for teacher-types (grades

TABLE 3.10

MEANS OF THE THREE SIGNIFICANT PUPIL-TEACHER INTERACTIONS ON PUPIL CREATIVITY MEASURES

Variables		Pupil Types: Conformers-Strivers (AE)	Pupil Types: Opposers (B)	Pupil Types: Waverers (C)	Teacher Types
Circles (Grade 2) Fluency	N	12	12	12	Turbulent (A)
	$\bar{X}$	12.333	8.917	8.750	
	N	12	12	12	Self-Controlling (B)
	$\bar{X}$	8.250	9.083	9.167	
	N	12	12	12	Fearful (C)
	$\bar{X}$	10.250	10.167	9.000	
Consequences (Grade 4) Fluency	N	16	16	16	Turbulent (A)
	$\bar{X}$	5.000	2.938	4.188	
	N	16	16	16	Self-Controlling (B)
	$\bar{X}$	4.250	2.875	2.500	
	N	16	16	16	Fearful (C)
	$\bar{X}$	3.188	3.375	4.125	
Flexibility	N	16	16	16	Turbulent (A)
	$\bar{X}$	3.938	2.375	3.000	
	N	16	16	16	Self-Controlling (B)
	$\bar{X}$	3.125	2.500	2.375	
	N	16	16	16	Fearful (C)
	$\bar{X}$	2.875	3.000	3.625	

TABLE 3.11

MEANS OF ACHIEVEMENT GAINS SCORES FOR TEACHER TYPES FOR GRADES ONE THROUGH FIVE

Grade	N	Teacher Types: Turbulent (A)	Teacher Types: Self-Controlling (B)	Teacher Types: Fearful (C)	Measure
1	36	101.75	99.89	100.08	
2	36	99.64	101.06	99.28	
3	48	100.06	100.69	99.60	Vocabulary Gains
4	48	100.60	99.44	99.56	
5	24	100.71	100.12	100.54	
1*	36	100.03	101.39	98.50	
2	36	99.64	100.14	100.25	
3*	48	101.19	102.79	97.54	Comprehension Gains
4	48	101.92	98.98	98.88	
5**	2	100.12	99.21	100.42	
1*	36	94.67	107.42	99.22	
2	36	99.69	100.39	99.25	
3	48	98.46	99.77	100.04	Arithmetic Gains
4*	48	102.44	100.72	98.47	
5	12	100.25	100.58	102.50	

*Significant teacher effects.
**Significant pupil-teacher interaction effects.

Note that scores less than 100 represent gains in a positive direction due to the method used in obtaining regressed gain scores. These scores have no intrinsic meaning.

one and three) indicate that the fearful teacher is most conducive to reading comprehension gains in their pupils.[1] With respect to arithmetic gains, the fearful teacher is again the one who is associated with positive gains, but only for grade five. At grade one, the self-controlling teacher has had the most positive results, and the turbulent teacher the most negative results on arithmetic gain. The turbulent teacher has also had the most negative results on comprehension gains in the two significant analyses at grades one and three.

Table 3.12 gives the means for the interaction between teacher- and pupil-types on the comprehension gains measure at grade five. These results suggest that the self-controlling teacher works best with the waverer-type of pupil, the turbulent teacher works best with the opposer pupil, and that the fearful teacher works best with the conformer-striver.

It is most difficult, of course, to draw any kind of systematic conclusions from these data. Generally speaking, however, the fearful teacher appears to have the most positive effect on pupil achievement gains, and the turbulent teacher, the most negative effect. It is interesting to note that the self-controlling teachers had the single most positive effect of all, and that was at grade one on arithmetic gains.

In general, the results obtained in this study fail to indicate significant or systematic relationships between the teacher-types and pupil-types as defined by Heil, et al. (1960). Those trends or

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[1] Note that scores less than 100 represent gains in a positive direction due to the method used in obtaining regressed gain scores. These scores have no intrinsic meaning.

TABLE 3.12

MEANS OF THE SIGNIFICANT PUPIL-TEACHER INTERACTION ON THE READING COMPREHENSION MEASURE

Pupil Types			Teacher Types
Conformers-Strivers (AE)	Opposers (B)	Waverers (C)	
101.62	96.88	99.12	Turbulent (A)
101.38	101.12	97.88	Self-Controlling (B)
96.00	103.38	101.88	Fearful (C)

relationships hinted at in the present study tend to be in opposition to the findings of the Heil study.

In the Heil study, the striver pupil group was found to show greater academic gain. In the present study, the striver-conformer pupils reflected little or no superiority over the other pupil groups with respect to achievement gains and only a sporadic superiority in creativity performance. Heil's self-controlling teachers were generally a better influence on all children in their study, whereas in the present study, the fearful teacher seems to have been most effective.

The reasons for the divergence in results of the present study from the results of the Heil study are difficult to assess. A number of differences between the two studies may certainly account for the differing results and for the relative lack of significant findings in the present study. To begin with, the Heil methods for categorizing teachers and pupils were not used. The present study employed a set of criterion personality measures for teacher-pupil selection which seemed to offer the same information with respect to selection. The rationale for the use of the Teacher Preference Schedule (TPS) has already been explained for substituting the TPS being that teacher clusters observed by the developers of the TPS (Stern and Masling, 1960) were noted to be virtually identical with teacher-types isolated by Heil and his associates. Addition of the Q-sort factor to provide a measure of ego-strength-neuroticism was, necessiated by the absence of such a measure in the TPS, and may have, in part, led to the selection of teacher samples different from those of the Heil study. Pupil selection in the present study differed from that in the Heil study. In the present study, the Sarason Test Anxiety scale was used along with three scales specially prepared for the

present population of pupils. In addition, the striver and conformer pupil-types had to be combined since there was no way of differentiating them on the criterion personality scales. These differences between the two studies may well explain the general failure of the present study to demonstrate the significant teacher-pupil interactions that the Heil study suggested.

CHAPTER IV

INTERCORRELATIONS AMONG PUPIL MEASURES

For this analysis all of the measures available on the individual pupils were submitted for correlation analysis and subsequent factor analysis with one exception. Due to the statistical procedures employed in multiple prediction, high correlations between the regressed gain scores and post-test scores are inevitable and would likely complicate the interpretation of a factor analysis. For this reason the post-test scores on the achievement measures were not included in the analysis. The factor analysis utilized a program included in "Biomedical Computer Programs published at UCLA entitled "BIMED No. 17." It is a principle components analysis which retains orthogonal factors and uses Kaiser's varimax criterion in rotating. The number of pupils per grade is approximately 350.

Results

The results of the factor analyses are remarkably consistent from grade to grade but unfortunately contribute little to the understanding of the domain under investigation. Although the sequence of extraction varies somewhat in the differing grades, remarkably similar factors are extracted. The factors are as follows: 1. a factor which loads highly on the California Test of Mental Maturity; 2. a factor which loads highly on the California Achievement Test; 3. a factor which loads highly on the tests of creativity or divergent thinking; 4. a factor loading heavily on the measures derived from the questionnaire with the exception of the

anxiety scale; and 5. a factor loading heavily on the CAT sub-test scores administered in the spring of the year. Thus, there are five major factors accounting for the major portion of the test variances in each of the five grades. The remaining five factors which are extracted tend to be very nearly specifics (having high loadings on only one or two measures) and show little consistency from grade to grade. It was to be expected that factors pertaining to specific instruments would emerge since this is almost inevitable when ability measures and 'personality' measures ar included in the same matrix. It was hoped, however, that some additional factors of interest would emerge but such was not the case. Hence, we must return to the original correlation matrixes to investigate relationships of interest.

Due to the rather large number of cases involved within each grade, the standard error of a correlation is in each case approximately .05; meaning that correlations of the magnitude of .10 would be significant at the five percent level. However, it was decided that only correlations above .20 would be discussed except where a trend appeared.

Gain Scores As Related To Other Variables

The nature of obtaining regressed gain scores precludes any correlations with the pre-test measures which are used in the regression equations and consequently these values are all zero in this study. Correlations with the post-test measures are quite high ranging in the .50's and .60's. This, however, is an artifact of the regressed gain score analysis in that the errors in prediction though unrelated to pre-test measures will inevitably tend toward the positive direction for the higher post-test scores and in the negative direction for the lower.

There is no pattern of consistency in relationship between the gain scores and scores on the creativity tests. There are sporadic correlations in the .20's but these fluctuate in direction and provide no consistent pattern. Thus, in grade one there is a positive correlation between the amount of gain in arithmetic and the score on the Circles-fluency, and flexibility measures while in the fifth grade there is a correlation of -.24 between the arithmetic gain and scores on the Incomplete Figures Test. In summary, there seems to be little relationship among these measures.

The correlations between achievement gain and the questionnaire measures of test anxiety, liking for school, etc. are on all measures and in all grades very close to zero. With respect to sex differences the only values emerging are a correlation of .21 in the first grade favoring the girls on reading comprehension and a .19 in the fifth grade in favor of the boys on reading vocabulary. One would not expect much by way of relationship of the gain scores with the categorical scores obtained on the Russell Sage device and for the most part the correlations are essentially zero; the only exception being a correlation of -.20 between arithmetic gain and being rejected during the operation stage of the planning in grade two. This isolated finding is probably of little importance.

Relationship of Test Anxiety To Other Measures

In all five grades the correlation between the test anxiety scale and CMM and CAT scores are negative ranging from -.04 to a -.36. There seems to be no consistent pattern as to which measures show the highest correlations from grade to grade nor is there a consistent pattern of overall magnitude from grade to grade. The highest correlations are observed

in grades one and five; the correlations running slightly lower in grades two, three, and four. These data seem quite consistent with previously reported data of this type.

Looking next at the creativity tests, here again most of the correlations are negative but of low magnitude and with some low positive correlations. There is not an impressive age trend or grade trend; the highest correlations, once again, being found in grade one and grade five. The highest correlations to be found are in grade five wherein the correlation with the scores on the Consequences Test which is of a verbal nature are in the .30's and negative indicating poorer performance on the part of the more highly anxious subjects. There are no significant correlations with the Russell Sage measures and this is to be expected. There is a very consistent relationship across grades between the anxiety measure and the questionnaire scale intended to reflect liking for school or teacher. The correlations are negative in all grades and are as follows in sequence from grade one through five: -.29, -.32, -.14, -.06, and -.18. The trend of these correlations suggests that the effect of anxiety as a deterent to school enjoyment is more pronounced in the earliest two grades than in subsequent grades. The correlations between anxiety and sex show virtually no relationship in the first two grades; in grades three, four, and five the correlations are respectively -.10, -.15, and -.17 suggesting that in these higher grades there is a higher degree of test anxiety on the part of the girls. These latter three correlations are significant beyond the five percent level.

Creativity Tests

Looking next at the creativity tests themselves, one of the first findings is that the different scores on the same device tend to correlate a good deal higher one with another than do similar scores across the devices; that is, on the Incomplete Figures Test the originality, closure, and productivity scores correlate more highly among themselves than does, for example, the originality score on the Incomplete Figures with the originality score on the Circles Test. This is not surprising, but is a pattern which exists within each of the grades.

Looking at the relationships between the creativity measures and scores on the CMM and CAT and taking first the Incomplete Figures Test in the first three grades, all of the correlations with the CMM and CAT are under .20. In grades four and five the correlation in both instances between the originality score and the reading vocabulary score in the spring testing (which was nearer the time of administration of the creativity measures) is in the .20's. With regard to the Circles Test the correlations between the fluency, flexibility, and originality scores and the ability measures are, for the most part, in the .20's and .30's in the first three grades and lower than this in grades four and five though there still are occasional correlations in the .20's. The Consequences Test was only administered in grades three through five but shows consistently positive correlations across the various other ability measures in the .20's, .30's, and .40's. In grades three and four the correlations are significantly higher with the CAT reading measures, vocabulary, and comprehension, than with the other measures, arithmetic and CMM, suggesting that in these grades the scores on the Consequences Test are more a function of reading skills than verbal or non-verbal intelligence. In

grade five the pattern is maintained, the correlations with the CMM being somewhat lower but not significantly so; the correlations, once again, being in the .30's.

There are almost no correlations above .20 between any of the creativity measures and any of the questionnaire measures; the only exception being a -.23 between the fluency measure of the Consequences Test and the questionnaire measure of dependency in grade five. Similarly there is only one correlation above .20 with the Russell Sage measures, this again being in grade five; .20 between incomplete figures and originality and leadership in the planning phase of the problem-solving task. Both of these correlations make some sense but may simply be capitalizing on chance in view of the large number of correlations involved.

With regard to sex differences, there are sex differences indicated in grades one and four on the circles measure. In grade one a correlation of -.26 with the fluency score, -.23 with the flexibility score; in grade four -.21 with the relevancy score and -.21 with the fluency score indicating that the girls scored somewhat higher on these measures in these two grades.

Questionnaire Measures

Looking next at the relationship of the remaining questionnaire measures, that is 'liking for school,' 'need achievement,' 'need affiliation,' 'dependency,' 'perceived achievement on the part of the teacher,' perceived control,' and 'perceived affiliation' with the other measures, we find first that the liking for school measure correlates in the .20's positively with proficiency on several of the achievement measures in the first two grades. Beyond grade two, however, there are no correlations

between liking for school and the ability measures. Aside from occasional values, which may be chance, the only remaining finding of interest is that the perceived control score correlates negatively with all of the ability measures in the fifth grade. The range of correlations being from -.19 to -.28 suggesting that the poorer students academically are the ones who perceive their teachers as more controlling of their behavior. There are no relationships of any magnitude between the questionnaire measures and the Russell Sage scores.

With respect to sex differences there is one very clear trend running through all five grades, and that is a correlation in the magnitude of .20 to the low .30's indicating greater expressed affiliation need and/or perceived affiliation on the part of the girls. Thus, for example, the need affiliation score has correlations of this magnitude in all but the second grade and in that grade the correlation with perceived affiliation is .24.

With regard to sex differences in expressed liking for school, in all five grades the correlations are negative which would suggest that girls like school better but in only the third grade does the value reach the level of .20. The correlations from grades one to five are as follows: -.05, -.15, -.20, -.13, and -.04.

Russell Sage Test

Looking next at the measures on the Russell Sage Test, there are no correlations above .20 in any of the grades with sex or with the liking for school measure. In grade two, however, there is a very interesting set of correlations, two of which are in the .20's indicating that hose students who were observed as assuming a leadership role in the operations phase of the problem-solving are the better students as measured by the ability tests. Further, there is a -.24 correlation between arithmetic proficiency and being observed as rejected by other students in the operations stage suggesting that thes variables are related in grade two. These relationships did not maintain in grades three and four. In grade five the relationship between ability and a leadership role in both the operations and planning stages is suggested by the pattern of correlations which are in the range of .10 to .20 quite consistently but none of which are over .20.

Sex Differences on CMM and CAT

Looking next at the correlations between sex and the ability measures, CMM and CAT, very few correlations of the magnitude of .20 are obtained nor is there a consistent pattern of direction of correlations. For example, in the fourth grade nine out of the nine correlations are negative in direction indicating better performance on the part of the girls and five of these are significant at the .05 level. However, in grade five eight out of the nine measures are positive indicating higher performance on the part of the boys and only one of these is significant.

The only correlations above .20 are -.21 with the reading comprehension spring score indicating better performance on the part of the girls in the first grade and a .20 between the CMM language score and sex in the second grade indicating higher performance on the part of the boys. Thus, there are no clear-cut sex differences on the ability measures which are maintained across the five grades.

Other

There are several other relationships which are worth mentioning. First relating to interrelationships among some of the questionnaire measures not previously reported. In particular, there is a consistent correlation between the questionnaire measure of liking for school and the questionnaire measure of need achievement; the correlations ranging in mangitude from .24 in grade two up to .35 in both grades one and five. It is, of course, possible that these correlations are an artifact of the questionnaire method but the questions asked in these two scales would on a priori grounds not seem to lend themselves to a spurious correlation. A second set of high correlations is, however, likely spurious in the relationship of liking for school and the questionnaire measures of perceived affiliation behavior on the part of the teacher. The similarity of items in these two scales may very well be responsible for these relationships.

The next set of correlations examined are measures on the CMM and CAT in the fall of the year. As would be expected, the correlations between the CMM and CAT scores are high, generally ranging from .32

An interesting feature of these interrelationships is the shifting relationship with the two CMM scores with change in grade. For example, looking at the fall arithmetic score we find that in the first grade the CMM language correlates .29 whereas the non-language correlates .42, a rather large difference in favor of the non-language score. By grade two the two correlations are almost the same, .42 and .47; and in grade three the direction is reversed, the correlation still with language, .45, and non-language, .39. In grade four the respective correlations being .48 and .34; and by the fifth grade the correlations being .65 and .49; so that as one progresses from first through fifth grade the change in correlation with the fall arithmetic score changes from being more highly correlated with the non-language CMM to being more highly correlated with the language CMM. Essentially the same pattern holds true with the reading measures in that in the first grade the non-language CMM is correlated more highly with the reading vocabulary and reading comprehension scores than is the language score. In the second grade the correlations are about the same; and in the third grade the language correlation is higher but in fifth grade is very much higher. In both the fourth and fifth grade the correlations with reading vocabulary for the language and non-language are respectively .77 and .46.

We may next look at the predictability of the spring achievement scores achieved by the CMM or the CAT in the fall testing. In the first grade the fall vocabulary test is as good or better predictor than any of the other measures for all three spring scores. It consistently predicts significantly higher than the CMM in arithmetic and in reading comprehension and about the same, .55, in the reading vocabulary. In the second grade the fall vocabulary score is the best predictor of both reading scores in the spring. The magnitude of correlation being about .65 whereas the CMM scores predicted about .40. The best predictor of the spring arithmetic performance is the fall arithmetic .59, the second best .47 with the fall vocabulary. This same pattern is maintained in the third grade where the best predictors of both reading scores in the spring are the fall vocabulary or fall comprehension, both predicting equally well. The best predictor of the spring arithmetic score is the fall arithmetic with the fall reading comprehension correlating almost as highly. In the fourth grade the best predictor of both the vocabulary and comprehension is the fall measure of the same variable with the other reading measure in the fall predicting almost as well. The best predictor of the arithmetic is the fall comprehension score with the fall arithmetic being second. In the fifth grade the same pattern as the fourth is maintained with the exception that the CMM total score serves as about an equally valuable predictor with the reading scores in this grade. Thus, up until the fifth grade the general pattern is for the fall reading test to be, in general, the best predictor of all three 'end of year' achievement measures give way in some cases to the fall measure of the same variable but almost without exception being a better predictor than the CMM score.

Intercorrelations among the achievement gain scores are of interest. A very consistent pattern of correlations between gain in reading vocabularly and reading comprehension is seen, the values in grades one through five respectively being: .49, .34, .34, .33, .34. It is likely that gain in comprehension in the first grade is largely dependent on increasing vocabulary. By the second grade this dependency likely is lessened and the relationship drops to .34 which remains stable in the succeeding three grades.

The correlations between gain in arithmetic fundamentals and reading vocabulary in grades one to five are: .28, .14, .27, .19, .09. The correlations between arithmetic gain and comprehension gain are: .30, .31, .26, .31, .27. It is seen that a correlation of about .30 with comprehension gain is appropriate to all five grades whereas the correlation with vocabulary gain is less consistent but generally lower. It should be kept in mind that these correlations suffer from the lowered reliability of gain scores.

CHAPTER V

CLASS GAINS ON TESTS OF CREATIVITY RELATED TO GAINS IN ACHIEVEMENT

It will be recalled that gains on the tests of creative thinking across one academic year were obtained for 19 teachers in grades two through five. The question raised in the present analysis is whether there is any relationships between the gains on creativity tests and gains on the achievement areas of reading vocabulary, reading comprehension, and arithmetic fundamentals when class averages are utilized. That is, do teachers who achieve greater gain in the content areas also demonstrate a greater class gain on tests of creativity? The creativity gains, it should be noted, are based on different children than are the achievement test gains; that is, the creativity measures were administered the year following that in which the achievement tests were given. The results are shown in Table 5.01. Inasmuch as there could have been relationships between the class gain scores and the grade and/or class I.Q. scores, these two variables were examined. It will be seen that there was a positive correlation between grade level and gain in reading comprehension and arithmetic, a very slight negative relationship between grade and reading vocabulary and a small positive correlation between grade and gain on the creativity tests. Thus, this variable was partialled out and the resulting partial correlations are also shown in Table 5.01. As to the possibility of a correlation with class intelligence level, possible even though the gain scores for individuals were controlled for intelligence, these correlations are also shown for the achievement measures and

the correlations are of such slight magnitude that an adjustment for intelligence was considered unnecessary. The probability that the correlations are chance departures from zero is less than .05 for the reading vocabulary and .12 for the arithmetic. Thus, these results suggest that the teacher who is more successful in developing reading vocabulary skills is also more successful in developing whatever skills are manifested on the tests of creativity. This result is somewhat surprising in view of the previously reported positive but low correlations between the non-verbal creativity tests and reading vocabulary when the correlations are run across pupils.

TABLE 5.01

"CREATIVITY" GAINS AND ACHIEVEMENT GRADES BY TEACHER (N = 18)

	Total Non-Verbal Creativity Gain	Grade	CMM	Creativity with Grade Partialled Out	
Reading Vocabulary Gain	.456	-.101	.071	.467	$p < .05$
Reading Comprehension Gain	-.073	.260	-.092	-.113	
Arithmetic Fundamentals Gain	.399	.353	.183	.380	$p \neq .12$
Grade	.134				

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